DECISION RECORD

Decision: After review of the Alternatives in EA-NM060-00-062 and with consultation with the permittee, Carl Madison it is my decision to adopt Alternative C as outlined in the EA. A 10 year grazing permit to Carl Madison for the West White Ranch Allotment #65023. The permit will establish seasonal grazing on the public land within the allotment. The West Hill pasture is comprised of all public land; the BLM River contains 80 acres of public lands and 25 acres of private lands. The permit will be for:

West Hill Pasture 15 AUs from 10/01 to 01/31 at 100% PL for 60 AUMs
BLM River Pasture 30 AUs from 07/01 to 08/31 at 100% PL for 60 AUMs

Any additional mitigation measures identified in the environmental impacts sections of the attached environmental assessment have been formulated into stipulations, terms and conditions. Any comments made to this proposed action were considered and any necessary changes have been incorporated into the environmental assessment.

If you wish to protest this proposed decision in accordance with 43 CFR 4160.2, you are allowed 15 days to do so in person or in writing to the authorized officer, after the receipt of this decision. In the absence of a protest, this proposed decision will become the final decision of the authorized officer without further notice, in accordance with 43 CFR 4160.3. Please be specific in your points of protest. A period of 30 days following receipt of the final decision, or 30 days after the date the proposed decision becomes final, is provided for filing an appeal and petition for the stay of the decision, for the purpose of a hearing before an Administrative Law Judge (43 CFR 4.470).
The appeal shall be filed with the office of the Field Office Manager, 2909 West Second, Roswell, NM, and must state clearly and concisely your specific points.

Signed by T. R. Kreager — 6/12/01
Assistant Field Manager — Date

ENVIRONMENTAL ASSESSMENT

for

Section 3

GRAZING AUTHORIZATION

on

ALLOTMENT 65023

Township 7 South, Range 26 East
Sections 8, 16, 17, 20, 21, 28 (all or part)

EA-NM-060-00-062

October 2000

U.S. Department of the Interior
Bureau of Land Management
Roswell Field Office
Roswell, New Mexico

I. BACKGROUND

A. Introduction

When authorizing livestock grazing on public range, the Bureau of Land Management (BLM) has historically relied on a land use plan and environmental impact statement to comply with the National Environmental Policy Act (NEPA). A recent decision by the Interior Board of Land Appeals, however, affirmed that the BLM must conduct a site-specific NEPA analysis before issuing a permit or lease to authorize livestock grazing. This environmental assessment fulfills the NEPA requirement by providing the necessary site-specific analysis of the effects of issuing a new grazing permit on Allotment 65023.

The scope of this environmental assessment is limited to the effects of issuing a new grazing permit on Allotment 65023. Over time, the need could arise for subsequent management activities which relate to grazing authorization. These activities could include vegetation treatments (e.g., prescribed fires, herbicide projects), range improvement projects (e.g., fences, water developments), and others. Future rangeland management actions related to livestock grazing would be addressed in project-specific NEPA documents as they are proposed.

Though this environmental assessment specifically addresses the impacts of issuing a grazing permit on Allotment 65023, it does so within the context of overall BLM management goals. Allotment management activities would have to be coordinated with projects intended to achieve those other goals. For example, a vegetation treatment designed to enhance watershed condition or wildlife habitat may require rest from livestock grazing for one or more growing seasons. Requirements of this type would be written into the permit as terms and conditions.

B. Purpose And Need For The Proposed Action

The purpose of issuing a new grazing permit would be to authorize livestock grazing on public range on Allotment 65023. The permit would be needed to specify the types and levels of use authorized, and the terms and conditions of the authorization pursuant to 43 CFR §§4130.3, 4130.3-1, and 4130.3-2.

C. Conformance With Land Use Planning

The proposed action conforms with the Roswell Approved Resource Management Plan (RMP) and Record of Decision (BLM, 1997) as required by 43 CFR 1610.5-3.

D. Relationships to Statutes, Regulations, or Other Plans

The proposed action and alternatives are consistent with the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1700 et seq.); the Taylor Grazing Act of 1934 (43 U.S.C. 315 et seq.), as amended; the Clean Water Act (33 U.S.C. 1251 et seq.), as amended; the Endangered Species Act (16 U.S.C. 1535 et seq.) as amended; the Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901 et seq.); Executive Order 11988, Floodplain Management; and Executive Order 11990, Protection of Wetlands.

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action - Current Livestock Management

The proposed action is to issue Carl and Pauline Madison a ten-year permit to graze cattle on Allotment 65023. Permitted use would be for 57 animal units (AUs), year-long at 18 percent federal range, which corresponds to 123 animal unit months (AUMs).[1]

Under the proposed action, management of the allotment would continue under the terms and conditions of the current permit. No changes to livestock management or to existing range improvements would be required.

B. Increase Permitted Use Alternative

Under Alternative B, Carl and Pauline Madison would be issued a ten-year permit to graze cattle on Allotment 65023. Currently, 23 AUs of temporary, nonrenewable use are authorized on the allotment, but under Alternative B this would become active use. Therefore, total permitted use would be increased to 80 animal units (AUs), year-long at 18 percent federal range, which corresponds to 173 animal unit months (AUMs). Other than an increase in permitted use, the terms and conditions would be the same as under the current permit.

C. Remove Private and State Lands from Allotment - Rancher Proposed Alternative

Under Alternative C all private and state lands would be administratively removed from Allotment 65023, leaving only 440 acres of BLM land in the allotment. Grazing preference would remain at 123 AUMs. Carl and Pauline Madison would be issued a ten-year permit to graze cattle on the allotment with the stocking rates and seasons of use described in Table 1.

Table 1. Alternative C - Stocking Rates and Seasons of Use

[1] For a cattle operation, an animal unit (AU) is defined as one cow with a nursing calf or its equivalent. An animal unit month (AUM) is the amount of forage needed to sustain that cow and calf for one month.

Pasture	Location	Acres	Stocking Rate	Season of Use	Duration
Hill West	Sec. 21	360	15 AUs	October 1 to January 31	4 months
BLM River	Secs. 17 & 20	80	30 AUs	July 1 to August 31	2 months

The bottomland pasture contains 25 acres of private land in addition to the 80 acres of BLM land. Livestock would never be enclosed in this pasture, but would be grazed simultaneously with the adjoining private-land pasture. Two gates between the pastures would be opened and livestock would be allowed to drift onto the 80 acres of BLM land.

Allotment 65023 would also be reclassified from an "M" category to an "I" category allotment. The change would reflect the more intensive management being proposed.

D. No Grazing Permit Alternative

Under this alternative a new grazing permit would not be issued for Allotment 65023. No grazing would be authorized on federal land on this allotment.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

A. General Setting

Allotment 65023 is in Chaves County, 22 miles northeast of Roswell. The Pecos River flows north-to-south through a broad alluvial valley on the west side of the allotment. The west half of the allotment is on the valley floor and lies within the 100-year floodplain. The east half of the allotment includes uplands above breaks that are dissected by numerous small draws. Elevations range from 3567 feet at the downstream end of the river to 3763 feet on the uplands in the southeast corner of the allotment.

The climate is semi-arid with normal monthly temperatures ranging from 20°F in January to 95°F in July at BLNWR (Owenby and Ezell, 1992). Observed minimum and maximum temperatures were -22°F and 113°F, respectively. Average annual precipitation is 11.6 inches, primarily as rainfall. Annual precipitation has ranged from 3.11 inches to 21.08 inches (Kunkel, 1984).

Allotment 65023 is considered a riparian allotment because of its 2.1 miles of riparian habitat along the Pecos River. Riparian (and wetland) areas are directly influenced by permanent free water, whether at the surface or in the subsurface. Compared to adjacent upland sites, the riparian area has a greater amount and diversity of vegetation. The diversity of plant species and availability of water makes riparian areas prime wildlife habitat.

Though the riparian areas along the river have tremendous resource values, they

have been altered by the regulation of river flows by upstream reservoirs, especially Sumner Lake. Durkin et al. (1994) point out that the lack of high flows and channel entrenchment have led to significant changes to the extent, character, and condition of the riparian/wetland community. The U.S. Fish and Wildlife Service (1997) also has found the alteration of flow patterns to be a principal threat to the Pecos bluntnose shiner, a federally threatened species in this reach of the river.

Reservoir releases are controlled by the Bureau of Reclamation, and are largely driven by irrigation demands. Management of allotment riparian areas by the BLM and the permittee will be within the constraints imposed by the regulation of river flows.

Public lands on the allotment provide benefits for other users, as well as the permittee. These uses include recreation (e.g., hunting and wildlife viewing), and natural gas development.

B. Affected Resources

The following resources or values are not present or would not be affected by the authorization of livestock grazing on Allotment 65023: Areas of Critical Environmental Concern, Cultural Resources, Native American Religious Concerns, Prime or Unique Farmland, Minority/Low Income Populations, Hazardous or Solid Wastes, Wild and Scenic Rivers, and Wilderness. Affected resources and the impacts resulting from livestock grazing are described below.

1. Livestock Management

Affected Environment

Mr. Madison currently grazes cattle on Allotment 65023 with a permitted use of 57 AUs year-long at 18 percent federal range, which corresponds to 123 AUMs. He is also authorized an additional 23 AUs of temporary, nonrenewable use through February 28, 2001, which corresponds to 50 AUMs.

Mr. Madison runs a cow-calf operation with a single herd. He generally utilizes the bottomland in the summer to make use of the forage produced and rotates the herd to the upland in the dormant season. Goldenrod, a plant that is poisonous to livestock during the dormant season, is a problem in some areas. Livestock generally avoid the goldenrod because Mr. Madison provides supplemental feed.

Livestock are watered from two wells located in Section 17 along with associated pipelines and troughs. They also water at the Pecos River and a few small reservoirs.

The allotment covers approximately 2340 acres, including 440 acres of BLM land,

620 acres of state land, and 1280 acres of private land. The private land is divided into1040 acres owned by the permittee, 200 acres that are privately leased, and 40 acres that are uncontrolled lands (i.e., not owned by the permittee, but not fenced apart from the allotment). The allotment is divided into five pastures as described in Table 2.

The allotment was placed in the "M" category (i.e., "maintain") based on monitoring studies. An M-category allotment indicates that the range condition is satisfactory, and in either a static or upward trend.

Table 2. Summary of Allotment Pastures

Pasture Name	Acres	Pasture Description
River	935	Privately owned or leased land primarily in the Pecos River floodplain.
BLM River	105	Small pasture on south end of river with 80 acres of BLM land.
State Section	620	State lease on upland and breaks above the floodplain in Section 16.
South	320	Private land including uplands and breaks above the river floodplain.
Hill West	360	BLM lands in the upland on the south part of the allotment.
Allotment Total	2340	Includes 40 acres of uncontrolled private land within the allotment.

Environmental Impacts

Under the Proposed Action, current livestock management would continue on the allotment. Grazing would also take place under Alternative B, but with the active use level increased to include the current temporary, nonrenewable use. Actual use could be adjusted based on changing rangeland conditions, but at present there is insufficient data to determine whether the increase in permitted use is sustainable in the long term.

Under Alternative C, the livestock operation would undergo fundamental changes. Private and state lands would be removed from the allotment. The BLM would no longer be involved in managing these lands, so the permittee would have more flexibility in managing this part of his operation. Livestock numbers and seasons of use on the public rangeland would be strictly controlled by the BLM however, giving the permittee much less flexibility in managing the remaining allotment lands. The numbers and seasons of use on the BLM land would be set to improve key resources, such as watershed function, wildlife habitat, and riparian health. Reclassifying the allotment as an "I" category allotment would make it a higher

priority for projects.

Under the No-Grazing Alternative, there would be no livestock grazing authorized on BLM lands. If livestock grazing were to continue on privately owned lands, adjacent BLM land would have to be fenced apart to prevent trespass on public lands (43 CFR 4140.1(b)(1)). The expense of fencing would be borne by the private landowner. Vandalism and littering would be more likely, and range improvements on public land that are currently maintained by the permittee would fall into disrepair.

Cumulative impacts of the grazing and no grazing alternatives were analyzed in *Rangeland Reform '94 Draft Environmental Impact Statement (BLM and USDA Forest Service 1994)* and in the *Roswell Resource Area Draft RMP/EIS (BLM, 1994)*. The no livestock grazing alternative was not selected in either document.

2. Vegetation

Affected Environment

Allotment 65023 is in the Grassland community type. It is described as a riparian allotment because of its proximity to the Pecos River. Riparian vegetation, found primarily within a narrow band along the river, is discussed in the Riparian/Wetland section of this environmental assessment.

Grass species on the upland include sand dropseed, mesa dropseed, threeawn species, black grama, plains bristlegrass, and bush muhly. Gravelly sites also support stands of gyp grama, burrograss, spike dropseed, and fluffgrass. Tobosa, alkali sacaton, sand dropseed, black grama, plains bristlegrass, and vine-mesquite are common bottomland species. Perennial forbs include croton, twin-leaf senna, blackfoot daisy, bladderpod, pepperweed, ragweed, and silverleaf nightshade. Principal shrub species found on the allotment are mesquite, snakeweed, fourwing saltbush, and javelina bush.

General objectives for each vegetation community are described in the Roswell Approved RMP and Record of Decision (BLM, 1997), and the Roswell Draft RMP/EIS (BLM, 1994). Table 3 presents the vegetation community objectives and monitoring data averages from 1981 to 1999 in terms of percent composition of vegetative cover and percent ground cover. The monitoring location is on a Sandy SD-3 site on BLM land in the south part of the allotment. The monitoring location is in a transition zone between ecological sites, therefore has some characteristics of a Gyp Uplands SD-3 site.

The condition rating indicates the ecological status of a plant community. It is the percentage of the plant community that is climax for the range site at the time of monitoring. The condition rating from 1981 to 1989 averaged 44 and was fairly stable (ranged from 31.7 to 50.3). The 1999 monitoring data showed the rating had

increased to 74, however, precipitation was unusually high in 1999.

Table 3. Grassland Vegetative Community Objectives (Allotment Monitoring Data Averages from 1981-99)		
Component	Percent Cover	Vegetative Cover by Percent Composition
Grasses	**15 - 52** (13)	**55 - 75** (85)
Forbs		**10 - 20** (1)
Shrubs	**3 - 12** (3)	**15 - 20** (14)
Trees		**1 - 10** (0)
Bare Ground	**14 - 60** (64)	Not Applicable
Small/Large Rock	**0 - 30** (<1)	
Litter	**8 - 44** (21)	

Environmental Impacts

Under the Proposed Action or Alternatives B and C, vegetation would continue to be grazed and trampled by livestock, primarily those species preferred as forage. Impacts would be greater under Alternative B due to the increase in livestock numbers. The current permitted use level appears sustainable based on monitoring data and allotment inspections. The high percentage of bare ground and low amount of herbaceous ground cover are probably due in part to the poor site conditions at the monitoring location, and are not considered representative of overall allotment conditions.

An increase in the permitted use level is not supported by the monitoring data at this time. The data might be skewed by the fact that there is only one monitoring location in a poor site, and because no data were collected between 1989 and 1999. The allotment condition rating[2] rose sharply from 1989 to 1999 when it rose from 50 to 74, though production and ground cover numbers remained fairly stable during the same period. Also, Mr. Madison has built fences that will allow more intensive livestock management. By establishing another

[2] The condition rating is the percentage of the plant community that is climax for the range site at the time of monitoring.

monitoring location on the bottomland, and collecting monitoring data more often, we would be able to better assess whether an increase in permitted use is warranted in the future.

Even if permitted use is not increased, any permittee may apply for temporary, nonrenewable use on an annual basis, and should be authorized when adequate forage is available. An allotment inspection would take place to determine whether temporary, nonrenewable use is warranted.

Under Alternative C, vegetation would be expected to improve on public rangeland. Livestock numbers and seasons of use would be set to enhance soil stability, watershed function, and biologic integrity. The additional monitoring location on the bottomland would help ensure that these goals are met.

Under the No-Grazing Alternative, no impacts to vegetation resources would occur on public lands from authorized livestock grazing. Vegetation cover would increase over the long term in some areas. Grasslands in the uplands would increase in cover and species diversity in the long term, but diversity would be tempered by mesquite dominating the shrub component. Alkali sacaton in the bottomland would increase in cover and composition over the short term, but could become decadent in the long term without livestock removing standing vegetation. Alkali sacaton composition would also be tempered by saltcedar dominating certain areas of the bottomland.

3. Invasive, Nonnative Species

Affected Environment

In accordance with the 1998 New Mexico Noxious Weed Management Act, the New Mexico Department of Agriculture assembled a Noxious Weed List for the state. African rue, a Class B species[3], is found on Allotment 64049 just to the west of Allotment 65023.

African rue, a member of the caltrop family, is a many-branched perennial that has an aggressive, woody root system. It has a bushy growth habit, fleshy stems and leaves, five-petaled white flowers, and a fruiting structure that is in the form of a capsule. It can be identified by the bitter, acrid taste and disagreeable odor of the stems when crunched (Lee, 1999).

[3] Class B weeds are nonnative species that are presently limited to portions of the state. They are designated for control in regions where they are not yet widespread. Preventing infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level with containment as the primary goal.

Saltcedar is a noxious weed species that also occurs on the allotment. Saltcedar is a Class C species[4] found on the Pecos River floodplain. No other noxious weeds have been documented on the allotment, though a comprehensive inventory has not been conducted.

Environmental Impacts

Saltcedar would continue to dominate the river floodplain under any management alternative. It is an invasive species that benefits from control of river flows and its ability to outcompete native species. Saltcedar control projects could be proposed under any alternative, and the choice of management alternative would have little effect on its success.

As with any activity, ranch operations could contribute to the spread of other invasive weeds under the Proposed Action or Alternatives B or C. Seed could be carried on vehicles, livestock, or horses, and disturbed sites could be colonized by invasive species. The allotment would be actively managed under the Proposed Action or Alternatives B or C, including ongoing rangeland monitoring that would result in early detection of weed invasions. Early detection and subsequent control efforts would offset any risk associated with grazing. Under Alternative C, the focus of the BLM would shift from the current allotment to the public rangeland only, thereby reducing the chance of early weed detection and treatment somewhat.

Choosing the No-Grazing Alternative would do little to reduce the risk of spreading invasive weeds. Livestock grazing would probably continue on private lands within the allotment and other uses, such as recreation and natural gas development would continue.

4. Soils

Affected Environment

The *Soil Survey of Chaves County, New Mexico, Northern Part (USDA Soil Conservation Service, 1983)* was used to describe and analyze impacts to soils. Soil map units represented on the allotment include: (1) Ustifluvents on the floodplains adjacent to the river; (2) Glendale-Pecos-Harkey association on the bottomland; (3) Holomex-Gypsum land-Alama, dry complex on the breaks east of the river; (4) Pajarito-Bluepoint complex also on the breaks; and (5) Hollomex-Reeves-Milner, dry loams on the uplands.

Generally, the soils are derived from calcareous alluvium with some residuum and eolian

[3] Class C weeds are also nonnative weeds found in New Mexico. Many of these species are widespread in the state. Long-term programs of suppression and management are a local option, depending on local threats and the feasibility of management.

deposits also present. The soils are typically deep and well-drained, with surface textures ranging from clay loam to loamy fine sand. Runoff is medium. The water erosion hazard is moderate, and the wind erosion hazard is high.

Ecological site descriptions are correlated to soil types and provide the basis for range trend analysis. The allotment is comprised of Bottomland SD-3 sites on the floodplain and adjacent areas, Gyp Upland SD-3 sites on the breaks, and Loamy SD-3and Sandy SD-3 sites on the upland.

Environmental Impacts

Under the Proposed Action or Alternatives B or C, authorizing grazing, livestock would remove some of the cover of standing vegetation and litter, and compact the soil by trampling. If livestock management is inadequate, these effects could be severe enough to reduce infiltration rates and increase runoff, leading to greater water erosion and soil losses (Moore et al., 1979, Stoddart et al., 1975). Producing forage and protecting the soil from further erosion would then be more difficult. The impacts of removing vegetation and trampling would be greatest in areas of concentrated livestock use, such as trails, waters, feeders, and shade. Soils on the allotment are also highly vulnerable to wind erosion. Removal of the vegetative cover increases the exposure of soils to the erosive force of wind.

Monitoring data and allotment inspections indicate, however, that the current level of grazing should be sustainable and maintain an adequate vegetative cover to protect soils from wind erosion. Based on monitoring data, increasing the permitted use under Alternative B could result in less ground cover and greater erosion rates. As discussed in the Vegetation section, additional rangeland monitoring would help ensure an adequate vegetative cover to protect soils from wind or water erosion by indicating when and where changes to livestock management are needed. It would also show whether an increase in permitted use would be sustainable. Significant impacts would not be expected on public rangelands under Alternative C because protecting soil stability would be an important goal when establishing livestock numbers and seasons of use.

Under the No-Grazing Alternative, any risk of overgrazing would be eliminated. However, removing grazing animals from an area where they were a natural part of the landscape could result in poor use of precipitation and inefficient mineral cycling (Savory, 1988). Bare soil could be sealed by raindrop impact, and vegetation could become decadent, inhibiting new growth. Therefore, the results of no grazing could be similar to those of overgrazing in some respects.

5. Water Quality

Affected Environment - Surface Water

The Pecos River flows for approximately 2.1 miles through the western part of the

allotment. No major tributaries cross the allotment, though numerous small draws drain the uplands to the east, and Sand Creek enters the Pecos at the north end of the allotment. The allotment

is on the river reach between Salt Creek and Sumner Dam, which is identified as Segment 2207 by the New Mexico Water Quality Control Commission (WQCC).

Under the authority of the federal Clean Water Act, the WQCC (2000b) has designated uses for streams in New Mexico. Designated uses for Segment 2207 include irrigation, a limited warmwater fishery, livestock watering, wildlife habitat, and secondary contact (e.g., wading).

The WQCC (2000b) also established water quality standards to protect the designated uses, and directs periodic water quality assessments to ensure that standards are met. According to the New Mexico Environment Department (NMED), Segment 2207 is currently meeting the standards for all its designated uses (Hogge, 1998; NMED, 1998a; NMED, 1999; WQCC, 2000a).

The permittee and the BLM have incorporated best management practices (BMPs)[5] into the operation of the ranch. BMPs include:

- Grazing Permit Authorization System - includes the preparation of this environmental assessment.
- Rangeland Monitoring - the allotment is assessed for vegetation production, composition and ground cover.
- Using a Rotation System - described in the Livestock Management section of the EA.
- Controlling Livestock Numbers - the BLM establishes overall numbers for the allotment, which are based on 19 years of monitoring data.
- Controlling Livestock Distribution - fencing, waters and other improvements allow livestock to be rotated among the five pastures on the allotment.
- Vegetation Treatments - includes efforts to improve rangeland health enhance ground cover, thus protecting soils and reducing water quality impacts.

Environmental Impacts - Surface Water

In general, livestock grazing is considered a potential cause of nonpoint source pollution, with sediment as the primary contaminant. Livestock grazing on the allotment, however, is not expected to be a significant cause of sediment loading to the Pecos River under any management alternative. The NMED conducted an intensive assessment of Pecos River water quality in 1997. They concluded that no water quality standards have been exceeded in the past ten years on Segment 2207 (NMED, 1998a;WQCC, 2000a).

[4] Best management practices (BMPs) are activities, practices, or procedures designed to prevent or reduce water pollution. BMPs include, but are not limited to structural or nonstructural controls, changes in operation and maintenance procedures, and management practices. BMPs can be applied before, during, or after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

The NMED also considered siltation and stream bottom deposits in evaluating impacts to the threatened Pecos bluntnose shiner and its habitat. The NMED cites a letter from the U.S. Fish and Wildlife Service (USFWS) that sediment conditions alone are not significant contributing factors in the ability of the bluntnose shiner to survive and reproduce. Instead, upriver reservoirs have trapped sediment and resulted in water exiting the reservoirs that is "starved of sediment." Therefore, sediment loading due to livestock grazing on the allotment would not be expected to significantly affect water quality under any alternative.

Bacteria and nutrients are other potential contaminants that can be related to livestock grazing. A review of historic water-quality data did not show any evidence of bacteria contamination of the river, but elevated levels of ammonia were noted during sampling in 1986 (NMED, 1998a). The level was still below the chronic standard for ammonia established by the state. The Roswell wastewater treatment plant was discharging during sampling, and is believed to have been the principal contributor to the elevated levels of ammonia. Bitter Lake National Wildlife Refuge was also mentioned by the NMED as a possible contributor. Because no water quality standards have been exceeded in more than ten years, livestock grazing on the allotment does not appear to have a significant impact on water quality.

Cumulative impacts to Pecos River water quality from grazing on Allotment 65023 would not be expected to be significant. The intensive assessment of the Pecos River by the NMED also included Segment 2206 (Salt Creek to Rio Peñasco) immediately downstream of Segment 2207. Potential sources of pollutants in Segments 2206 and 2207 include rangelands, irrigation return flows, dairies, municipal and industrial sources, mineral development, and road construction and maintenance. Even considering all these potential pollution sources, neither segment had a documented exceedance of any water quality standard.

Affected Environment - Ground Water

The allotment falls within the northern part of the Roswell Underground Water Basin (New Mexico State Engineer, 1995). Ground water can be found in the alluvial aquifer at depths ranging from less than 10 feet along some parts of the river, to more than 65 feet in the uplands (Wilkins and Garcia, 1995; Hudson and Borton, 1983). Yields of 100 gallons per minute or more from the alluvium are common along the river (Geohydrology Associates, Inc., 1978). Ground-water quality is generally good, though data are limited.

Environmental Impacts - Ground Water

Livestock grazing would not be expected to have a significant impact on ground-water quality. Livestock would be dispersed over the allotment, and the soil would filter potential contaminants.

The WQCC has the primary responsibility for ground-water quality management in New Mexico. In their most recent report on water quality in New Mexico, the WQCC (1996) did not find livestock grazing on rangelands to be an important potential source of contamination to ground water.

Wilson (1981) also discussed potential sources of ground-water contamination and the relative vulnerability of aquifers in New Mexico. He identified animal confinement facilities (e.g., dairies, feedlots) as potential sources of contamination elsewhere in New Mexico, including areas in the Pecos valley downstream from the allotment. Wilson did not identify livestock grazing on rangelands, however, as an important potential source of ground-water contamination.

Cumulative impacts to ground-water quality from grazing on Allotment 65023 would be negligible. Grazing impacts would be insignificant when compared to other potential sources of contamination, such as mineral development, saline intrusion, and agriculture.

6. Floodplains

Affected Environment

The properties of any stream or river are due to the interaction of its channel geometry, streamflows, sediment load, channel materials, and valley characteristics (Rosgen, 1996). The form and fluvial processes of the Pecos River have been modified by the construction of dams, which have drastically altered the streamflow and sediment regimes of the river. Flooding is less frequent and less severe than prior to dam construction, and sediment loads have been greatly reduced (see Figure 1). As a result, the channel has become moderately entrenched, and exhibits much less lateral migration than in the past.

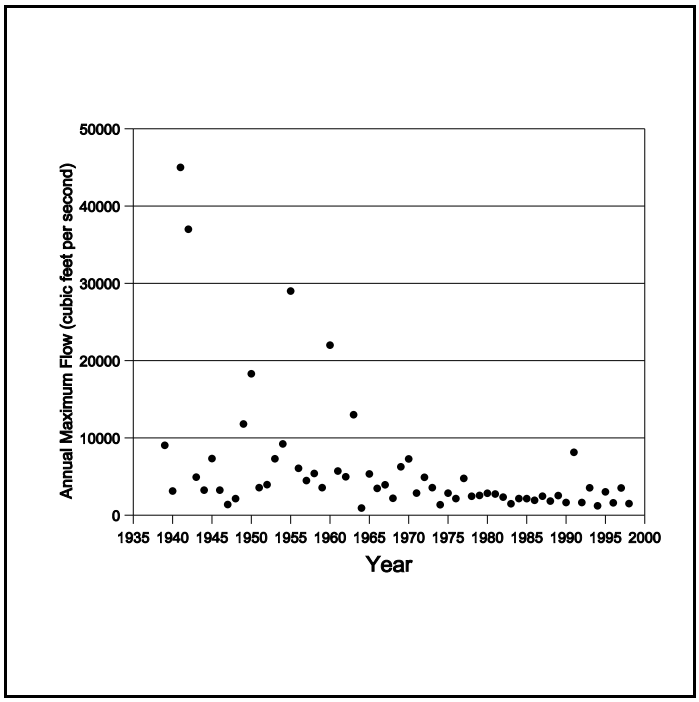

Figure 1. Annual maximum flow at USGS gage at Acme, New Mexico (08386000) for period 1939-1998 (Ortiz et al. 1999). In the 25-year period 1939-1963, an annual maximum flow of 8000 cfs was exceeded nine times. In the 35-year period 1964-1998, 8000 cfs was exceeded only once (1991).

Flow regulation with the dams has also changed the extent, character, and condition of the riparian area on the river (Durkin et al., 1994). Sediment deposition on floodplains is important for riparian succession, and seasonal flooding is required for obligate riparian vegetation.

For administrative purposes, the 100-year floodplain provides the basis for floodplain management on public lands. It is based on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (1983). The 100-year floodplain of the Pecos River covers approximately 870 acres on Allotment 65023, including 80 acres of BLM land and 790 acres of private land. Current floodplain development on the allotment consists of about one mile of road, five producing gas wells on private land, and fencing.

Environmental Impacts

The reduction in the frequency and magnitude of peak flows on the river would continue to be the primary influence on floodplain function. Whether or not grazing is authorized would have little additional influence.

There would be little change to the level of development on the Pecos floodplain under any alternative that would authorize grazing. Roads and fences would continue to be used and maintained. Development unrelated to livestock grazing (e.g., natural gas production) would be unaffected.

Under the No-Grazing Alternative, some roads could be abandoned and fences removed, but these changes would be insignificant compared to all factors affecting floodplain function. New fences might be constructed to prevent livestock from moving onto public rangeland. Vegetation cover and diversity would probably increase somewhat on the rangelands, and localized impacts, such as cow trails, might revegetate over time.

Livestock grazing under any Alternative would not add to cumulative effects to the floodplain beyond the current level of development. The No-Grazing Alternative might improve floodplain function slightly because vegetation cover would increase, and some roads and fences might be removed or abandoned. The improvement expected under the No-Grazing Alternative would be insignificant, however, because current livestock impacts are minor compared to all other impacts to the floodplain, and because additional fences might be constructed.

7. Riparian/Wetland Areas

Affected Environment

Riparian areas are found along 2.1miles of the Pecos River on the allotment, most of it privately owned. There are 80 acres of BLM land on the south end of the allotment, which include a one-half mile reach of the river. The 100-year floodplain is approximately one mile wide in this reach of the river.

The riparian vegetation community is tied to land form within the floodplain and is influenced by flooding intervals. The land form is comprised of exposed and stabilized river bars, the floodplain, and terraces. The river channel is moderately entrenched and slightly confined by the valley (Durkin et al., 1994). Channel banks are fairly stable, but are

sloughing or actively being cut in some locations. Bank erosion is most likely due to entrenchment of the channel rather than disturbance associated with livestock grazing or other land uses activities. The channel material is primarily a sand/silt bed with small to medium debris, and the stream gradient is relatively flat (0.25 percent).

Riparian species present include seepwillow, coyote willow, saltcedar and scattered cottonwoods. Cattails, rushes, and sedges are also present. Bottomland grasses consist of alkali sacaton, tobosa, and inland saltgrass.

Environmental Impacts

Under the Proposed Action or Alternative B, livestock would continue to use the riparian area along the Pecos River. The greatest vegetation impacts would occur at livestock concentration areas, such as crossings, shaded areas, and accessible points along the river. Some bank sloughing could occur from trampling in some locations.

Under Alternative C, the permittee would be free to use the riparian area on the private lands as he sees fit because it would be removed from the allotment. The 80-acre parcel of BLM land on the river would have livestock numbers and seasons of use strictly controlled. Livestock impact would be minimized because gates to adjacent private lands would be opened and livestock would be allowed to drift into the BLM pasture.

Under the No-Grazing Alternative, the condition of vegetation in the floodplain and riparian areas would improve somewhat. Enhancements in vegetative cover and diversity would continue to be limited by the regulation of river flows and channel entrenchment, which promote the growth of saltcedar and other exotic species. Grasses would initially increase following the exclusion of livestock, but plant vigor could decline from lack of vegetation removal, making ground cover species rank. Because livestock grazing would not be permitted under this alternative, the range program would be less likely to implement range improvement projects, such as brush control and exotic species control.

8. Wildlife

Affected Environment

The allotment provides a variety of habitat types for terrestrial and aquatic wildlife species. The diversity and abundance of wildlife species in the area are due to the presence of open water, the numerous drainages interconnecting upland habitats to the Pecos floodplain, a mixture of grassland habitat and mixed desert shrub vegetation, and riparian vegetation found within the floodplain of the river.

Common mammal species using the area include mule deer, coyote, gray fox, bobcat, striped skunk, porcupine, racoon, badger, jackrabbit, cottontail, white-footed mouse, deer mouse, grasshopper mouse, kangaroo rat, spotted ground squirrel, and woodrat.

Numerous avian species use the Pecos River during spring and fall migration, including nongame migratory birds. The Bitter Lake National Wildlife Refuge (BLNWR) is several miles downstream from the allotment, and serves as a major focal point for migratory birds (e.g., ducks, geese, cranes, waterbirds). Common bird species are mourning dove, mockingbird, white-crowned sparrow, black-throated sparrow, blue grosbeak, northern oriole, western meadowlark, Crissal thrasher, western kingbird, northern flicker, common nighthawk, loggerhead shrike, and roadrunner. Raptors include northern harrier, Swainson's hawk, American kestrel, and occasionally golden eagle and ferruginous hawk.

The Pecos River once supported a wide variety of native fish species adapted to the flow regime that existed prior to dam construction, agriculture development, and the introduction of non-native fish species. The greatest impact to fish habitat is the manipulation of water supply to meet irrigation needs. Representative fish species include the red shiner, sand shiner, Arkansas River shiner, Pecos bluntnose shiner, plains minnow, silvery minnow, plains killifish, mosquitofish, speckled chub, river carpsucker and channel catfish.

A variety of herptiles also occur in the area. Species include the yellow mud turtle, box turtle, eastern fence lizard, side-blotched lizard, horned lizard, whiptail, hognose snake, coachwhip, gopher snake, rattlesnake, and spadefoot toad.

Environmental Impacts

Under the Proposed Action or Alternative B, livestock grazing, if not properly managed, could impact wildlife habitat if vegetation that provides forage, browse, and cover for a variety of wildlife species is overutilized. Impacts would be somewhat greater under Alternative B.

Wildlife habitat would improve somewhat under Alternative C. Maintaining or improving the biological integrity of the public lands would be a major goal when determining livestock numbers and seasons of use under this alternative.

Under the No-Grazing Alternative, wildlife habitat would moderately improve. Livestock would no longer compete directly with wildlife for forage, browse, and cover. Improvement would continue to be limited by invasive species (e.g., mesquite, snakeweed), which affect plant composition. Since livestock grazing would not be permitted under this Alternative, range improvement projects that had benefitted wildlife, such as water developments, would be abandoned. New range improvement projects that could benefit wildlife habitat, such as brush control, may not be implemented because these projects are primarily driven and funded through the range program.

9. Threatened and Endangered Species

The Pecos bluntnose shiner, Pecos gambusia, interior least tern, and Pecos sunflower are federally listed species that occur or have the potential to occur on the allotment. Federally proposed species include the Pecos pupfish and the mountain plover. The status and presence of these species in the RFO area are discussed in the following section.

Pecos Bluntnose Shiner *(Notropis simus pecosensis)* - Federal Threatened

Affected Environment

Historically, the Pecos bluntnose shiner inhabited the Pecos River from Santa Rosa to near Carlsbad, New Mexico. Currently, the subspecies is restricted to the river from the Fort Sumner area southward locally to the vicinity of Artesia, and seasonally in Brantley Reservoir (NMDGF 1988; USFWS 1992). Routine fish community monitoring conducted by the USFWS in the Pecos River between Sumner Dam and Brantley Reservoir show the fish remains generally abundant, especially in light of cooperative efforts between the Bureau of Reclamation and the USFWS to more closely mimic natural flows in the Pecos River.

There are two designated critical habitat areas on the Pecos River within the RFO area. The first is a 64-mile reach beginning about ten miles south of Fort Sumner, downstream to a point about twelve miles south of the DeBaca/Chaves county line. The second reach is from Highway 31 east of Hagerman, south to Highway 82 east of Artesia.

The primary threat to the Pecos bluntnose shiner appears to be the manipulation of flows in the Pecos River to meet irrigation needs, and the subsequent drying of the river channel (Hatch et al. 1985). High flows in late winter-early spring before natural spring runoff appear to displace fish into marginal downstream habitats, including Brantley Reservoir. Cessation of reservoir releases after spring runoff and before the advent of summer rains desiccates long stretches of the Pecos River. Maintenance of water levels within the Pecos River and its tributaries is beyond the management authority of the BLM. In addition to the manipulation of flows is the threat posed by non-native fish. The introduction and establishment of species such as the Arkansas River shiner offers direct competition with the Pecos bluntnose shiner.

Livestock grazing does not appear to be a threat to the bluntnose shiner based on a review of the literature. Nor was grazing identified in the Pecos Bluntnose Shiner Recovery Plan as having the potential to adversely affect water quality, and thus the bluntnose shiner (USFWS 1992).

Environmental Impacts

Impacts to the Pecos sunflower due to livestock grazing would be negligible under the Proposed Action or Alternative B or C. Under the No-Grazing Alternative, no impacts from livestock grazing would occur. Based on the assessment of Pecos River water quality

conducted by the NMED in 1997, it appears that the shiner would not be affected by poor water quality if a grazing permit were issued.

Section 303(d) of the federal Clean Water Act requires that the State identify those waters for which existing required pollution controls are not stringent enough to meet State water quality control standards. The State must then establish total maximum daily loads (TMDLs) for pollutants of these water-quality-limited stream segments.[6] The presence of critical habitat for the threatened Pecos bluntnose shiner raised the Pecos River to a priority one on the New Mexico 303(d) ranking system.

Segment 2206 (Pecos River from Rio Peñasco to Salt Creek) had been listed for TMDL development because of concerns about stream bottom deposits, dissolved oxygen, total dissolved solids, metals, and un-ionized ammonia. Following a review of historical data and their survey, however, the NMED (1998a) concluded there was no basis for developing TMDLs on Segment 2206. The NMED (1998b) removed the segment of the Pecos River from the 1998-2000 303(d) list.

NMED's decision to remove Segment 2206 from the 303(d) list bears directly on the Biological Opinion rendered by the USFWS on the Roswell Resource Management Plan. The USFWS cited the New Mexico Water Quality Control Commission's 305(b) report in their opinion. The report identified siltation, reduction of riparian vegetation, and streambank destabilization as among the probable causes for the Pecos River in the RFO area not supporting its designated use as a warm water fishery, and identified rangeland agriculture as a probable source of the nonsupport. Just as Segment 2206 was removed from the 303(d), the next 305(b) report will no longer list the segment as water quality-limited (Hogge 1998).

Pecos Gambusia *(Gambusia nobilis)* - Federal Endangered

Affected Environment

The Pecos gambusia is endemic to the Pecos River Basin in southeastern New Mexico and western Texas. Historically, the species occurred as far north as the Pecos River near Fort Sumner, and south to Fort Stockton, Texas.

Recent records indicate, however, that its native range is restricted to sinkholes and springs and their outflows on the west side of the Pecos River in Chaves County. In spite of population declines, the species remains locally common in a few areas of suitable habitat. The BLNWR and the Salt Creek Wilderness Area contain the key habitat of the species in the RFO area. On the refuge, the gambusia is primarily restricted to springs and sinkholes

[5] The TMDL is defined as "the greatest loading or amount of the pollutant that may be introduced into a watercourse or stream reach from all sources without resulting in a violation of water quality standards."

in the Lake St. Francis Research Natural Area.

Endangerment factors include the loss or alteration of habitat (e.g., periodic dewatering) and introduction of exotic fish species (e.g., mosquitofish). Potential impacts to habitat may also occur from surface disturbing activities at sinkholes or springs and their outflows.

Environmental Impacts

No impacts to the Pecos gambusia would result from livestock grazing. No springs or seeps exist on BLM land within the allotment that would provide year-long habitat for the gambusia.

Interior Least Tern *(Sterna antillarum athalassos)* - Federal Endangered

Affected Environment

The interior least tern nests on shorelines and sandbars of streams, rivers, lakes, and man-made water impoundments. Records of breeding terns in New Mexico are centered around BLNWR where the species has bred regularly since it was first recorded in 1949. BLNWR is considered "essential" tern breeding habitat in the state. Besides BLNWR, the only known nesting habitat in the RFO area is an alkali flat due north of the refuge on public lands. These are small populations with only a few nesting terns.

Sporadic observations of least terns have been recorded elsewhere in the Pecos River valley. The tern may occur on public lands in Chaves County along the river because suitable nesting habitat is found on sites that are sandy and relatively free of vegetation (i.e., alkali flats). Approximately 44 potential nesting sites are found throughout the RFO area. Other potential habitat sites are saline, alkaline, or gypsiferous playas that occasionally hold water. However, ephemeral playas do not support fish, the main staple for terns.

Specific surveys for nesting least terns have been conducted in potential habitat along the Pecos River and playas by the New Mexico Natural Heritage Program under a Challenge-Cost-Share agreement with the BLM. No other nesting terns have been found to date.

Environmental Impacts

No impacts to the interior least tern would result from livestock grazing. Recent habitat surveys found no breeding populations in potential nesting habitat that occurs as sand bars within the river channel.

Pecos (Puzzle) Sunflower *(Helianthus paradoxus)* - Federal Threatened

Affected Environment

The Pecos sunflower is found along alkaline seeps and cienegas of semi-desert grasslands and short-grass plains (4,000-7,500 ft.). Plant populations are found both in water and where the water table is near the ground surface.

In the RFO area, the sunflower is found in only a few areas outside of the BLNWR. In 1994, a new population was found growing on the margins of Lea Lake and its outflow at Bottomless Lakes State Park. Lloyd's Draw, east of the Pecos River, has the only known Pecos sunflower population on BLM land. It became evident at this location following a prescribed fire. Potential habitat also occurs on BLM land within the Overflow Wetlands Wildlife Habitat Area.

Potential habitat for the sunflower occurs on the allotment as low lying areas where the water table is near the ground surface. The low lying areas are not only along the existing river channel, but in old channel courses and oxbows. These areas are now invaded by saltcedar growing in dense stands, which might prevent the viability of the Pecos sunflower. No Pecos sunflower populations have been found on the allotment to date. Endangerment factors include dewatering of riparian or wetland areas where the sunflower is found, and surface disturbing activities, and excessive livestock grazing.

Environmental Impacts

Impacts to the Pecos sunflower due to livestock grazing would be negligible under the Proposed Action or Alternative B or C. Impacts would not occur under the No-Grazing Alternative. The dominance of its potential habitat by saltcedar appears to be a major factor controlling the sunflower's abundance and distribution. Populations of the sunflower might become established following saltcedar control in certain areas is seeds are present in the soil.

Mountain Plover *(Charadrius montanus)* - Federally Proposed

Affected Environment

The mountain plover was recently proposed for listing as an Endangered Species. It is associated with shortgrass and shrub-steep landscapes throughout its breeding and wintering range. Historically, on the breeding range, it occurred on nearly denuded prairie dog towns and in areas of major bison concentration. The mountain plover are considered to be strongly associated with sites of heaviest grazing pressure, to the point of excessive surface disturbance. Short vegetation, bare ground, and a flat topography are now recognized as habitat-defining characteristics at both breeding and wintering locales.

In 1995, the New Mexico Department of Game and Fish contracted surveys for the

mountain plover in New Mexico (Sager, 1996). No breeding populations were found south of 34° north latitude, which generally follows the Chaves/DeBaca county line on the north end of the Roswell Field Office area. No birds were reported in either DeBaca or Chaves counties. Only one observation was reported in Lincoln County near Lon.

In addition, mountain plover surveys were conducted in 1998 at BLM selected sites by the New Mexico Natural Heritage Program (DeLay and Johnson, 1998). No mountain plovers were observed at the sites.

Environmental Impacts

Because mountain plovers prefer short vegetation and actually seek out grazed pastures, grazing under any alternative would not be expected to adversely affect the bird. Since no wintering locales or breeding sites have been found and no known prairie dog towns exist on this allotment, proper grazing management would not be likely to jeopardize, destroy, or adversely modify plover habitat. Grazing practices which maintain or improve ground cover to the greatest extent possible could decrease mountain plover habitat. There would be no change in the mountain plover habitat under the No-Grazing Alternative.

10. Visual Resources Management

Affected Environment

The entire allotment is in a Class III area for visual resources management. In a Class III area, contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. The changes, however, should remain subordinate to the existing landscape.

Environmental Impacts

The basic elements of the landscape would not change within the allotment under any management alternative. Potential impacts to visual resources would be analyzed and mitigated as allotment management activities are proposed in the future.

11. Recreation

Affected Environment

A network of roads provide access to public and private lands within the allotment, although legal public access is limited. Access to some of the private land is controlled by fences with locked gates. The BLM has designated off-highway vehicle use on public lands in the area as limited to existing roads and trails.

The allotment provides habitat for numerous game species including desert mule deer, mourning dove, and scaled quail. Predator and feral pig hunting may occur on the

allotment, as well as trapping for predators or furbearers. Access to the river is limited on the allotment, though it is possible that fishing or minnow seining could take place. General sightseeing, wildlife viewing, and photography are nonconsumptive recreational activities that may occur on the allotment.

Environmental Impacts

Under the Proposed Action or Alternative B or C, no direct negative impacts to recreational activities on public lands would occur. Potential conflicts could arise between recreational pursuits and ranching activities, depending on hunting seasons and livestock use in a given pasture. Vandals could damage range improvements.

Under the No-Grazing Alternative, no conflicts between ranching activities and recreational use would occur on public lands. Success of hunts and nonconsumptive opportunities would remain the same or slightly improve. Vandalism could still occur.

12. Significant Caves and Karst

Affected Environment

Allotment 65023 is in an area of medium potential for the occurrence of caves and karst. No caves or major karst features have been reported for the allotment, though a comprehensive inventory has not been completed.

Environmental Impacts

Because no caves or major karst features are known to exist on the allotment, impacts to these resources are not expected to be significant under any alternative. It is possible that cave or karst features exist on the allotment, but have not yet been discovered. If a feature is discovered in the future, protective measures could be required to mitigate adverse impacts to the feature. Fencing to exclude livestock and off-highway vehicles might be prescribed to prevent soil erosion, vegetation trampling, and livestock effluent from reaching the cave. A separate environmental analysis would be prepared prior to fence construction.

13. Air Quality

Affected Environment

The allotment is in a Class II area for the Prevention of Significant Deterioration of air quality as defined by the federal Clean Air Act. Class II areas allow a moderate amount of air quality degradation.

Air quality in the region is generally good, with winds averaging 10-16 miles per hour depending on the season. Peak velocities reach more than 50 miles per hour in the spring.

These conditions rapidly disperse air pollutants in the region.

Environmental Impacts

Dust levels resulting from allotment management activities would be slightly higher under the Proposed Action than the No-Grazing Alternative. The cumulative impact on air quality from the allotment would be negligible compared to all pollution sources in the region.

IV. CUMULATIVE IMPACTS

A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The analysis of cumulative impacts is driven by major resource issues. The action considered in this environmental assessment (EA) is the authorization of livestock grazing on Allotment 65023, and the major issues include:

(1) threatened and endangered species associated with the Pecos River, primarily the Pecos bluntnose shiner,

(2) Pecos River water quality, and

(3) riparian/wetland habitat within the Pecos River floodplain.

The incremental impact of issuing a grazing permit on these resources must be analyzed in the context of impacts from other actions. Other BLM actions that could have impacts on the identified resources include: livestock authorization on other allotments along the Pecos River; oil and gas activities on the river floodplain and on the uplands; rights-of way crossing the river; and recreation use, particularly off-highway vehicles.

All authorized activities which occur on BLM land can also take place on state and private lands. In addition, significant impacts could result from reservoir management and the manipulation of river flows, and downstream agricultural activities (e.g. dairies, crop production, and irrigation diversions and return flows).

Many of the actions which could contribute to cumulative impacts have occurred over many years. Impacts from open-range livestock grazing in the last century are still being addressed today. Sumner Dam, the principal structure controlling river flows in this reach, was built in 1937. Major irrigation projects were begun in the 19th century, and oil and gas activities began in the early part of the 20th century. All these activities are still occurring today, and are expected to continue into the foreseeable future to some degree.

The Proposed Action or Alternative C would not add incrementally to the cumulative impacts to threatened and endangered species, to Pecos River water quality, or to riparian/wetland habitat within the Pecos River floodplain. Implementing Alternative B might result in significant impacts to the riparian health due to the increase in permitted use. Expected impacts are difficult to determine due to the limited monitoring data available. The conclusions stated here are discussed in more detail in Section III of the EA.

If the No-Grazing Alternative were chosen, some possibly adverse cumulative impacts to riparian/wetland habitat would be eliminated, but others would occur. Grazing would no longer be available as a vegetation management tool, and BLM lands within the allotment would be less intensively managed. For example, alkali sacaton in the bottomland would likely become decadent without livestock impact, and control of exotic plant species such as saltcedar would be less likely without allotment management.

V. MITIGATION MEASURES

Mitigation measures are actions which could be taken to avoid or reduce impacts likely to result from the Proposed Action or Alternatives. The following mitigation measures address possible impacts from livestock grazing under the Proposed Action or Alternative B or C.

Vegetation monitoring studies and riparian assessments would continue if a new grazing permit were issued. A new monitoring location would also be established on the bottomland in 2001 and data would be collected from both sites in 2001. To provide a better assessment of range conditions under Mr. Madison's management, data would be collected again in three years rather than waiting for the standard five-year cycle. Changes to livestock management would be made if monitoring data show that adverse impacts to upland or riparian vegetation are occurring. Changes could also be implemented if conditions are found to be better than reflected by existing data.

It is possible that unforeseen impacts to other resources could occur during the term of the permit. If adverse environmental impacts are observed, action would be taken to mitigate those impacts at that time.

VI. RESIDUAL IMPACTS

Residual impacts are direct, indirect, or cumulative impacts that would remain after applying the mitigation measures. Residual impacts following authorization of livestock grazing would be insignificant if the mitigation measures are properly applied.

VII. FUNDAMENTALS OF RANGELAND HEALTH

Through the Rangeland Reform '94 initiative, the BLM developed new regulations for grazing administration on public lands. With public involvement, fundamentals of rangeland health were established and written into the new regulations. The fundamentals of rangeland health are identified in 43 CFR §4180.1, and pertain to (1) watershed function; (2) ecological processes; (3) water quality; and (4) habitat for threatened, endangered, and other special status species. Based on available data and professional judgement, the evaluation by this environmental assessment indicates that conditions identified in the fundamentals of rangeland health exist on Allotment 65023.

VIII. BLM INTERDISCIPLINARY TEAM

Dan Baggao	Paul Happel	Irene Salas
Jerry Dutchover	Tim Kreager	Jim Schroeder
Pat Flanary	Howard Parman	John Spain

IX. PERSONS OR AGENCIES CONSULTED

Mr. Carl and Pauline Madison - Permittees
Calvin Raymer - Private Land Lessor
Owen Stephens - Private Land Lessor
John White - Private Land Lessor
Chaves County Public Land Use Advisory Committee
Forest Guardians
New Mexico Department of Game and Fish
New Mexico Ener., Min., and Nat. Resour. Dept. - For. and Resour. Conserv. Div.
New Mexico Environment Department - Surface Water Quality Bureau
New Mexico State Land Office
U.S. Fish and Wildlife Service - Ecological Services
U.S. Fish and Wildlife Service - Fishery Resources Office

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